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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/033,114	10/22/2001	Tai-Peng Lee	M-11912 US	7687

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EXAMINER

GARCIA, JOANNIE A

ART UNIT	PAPER NUMBER
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2823

DATE MAILED: 06/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/033,114

Applicant(s)

LEE ET AL.

Examiner

Joannie A Garcia

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

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The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 1-40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 1, 11, 19, and 29, lines 2, 1, 2, and 2, respectively, "acts" after "comprising the", should be replaced with --steps--.

In claims 12, 24, and 35, line 3, "acts" before "comprising" should be replaced with --steps--.

In claim 9, line 1, "act" after "comprising the" should be replaced with --step--.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1, 2, 9, 10, 12, and 13, are rejected under 35 U.S.C. 102(a) as being anticipated by Chao et al (U.S. Patent 6,291,030).

Chao et al discloses using oxygen and silane gases to deposit silicon dioxide 501 over substrate 407 by a HDP-CVD process (Figure 5, Column 2, lines 65-67, and Column 3, lines 1-15, and 40-43), using ions to concurrently sputter etch a portion of the deposited silicon dioxide during the deposition (Column 2, lines 65-67, and Column 3, lines 1-15), and controlling the etch and deposition of the silicon dioxide such that an etch to deposition ratio is 0.0 (Column 3, lines

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40-43). Chao et al discloses as well, depositing the silicon dioxide layer over an electrically conductive layer used as a metal interconnect 401 (Abstract, Figure 5, Column 2, lines 45-46, and 51-52, and Column 3, lines 1-4, and 40-50).

Claims 3-8, and 14-40, are rejected under 35 U.S.C. 103(a) as being unpatentable over Chao et al as applied to claims 1, 2, 9, 10, 12, and 13 above, and further in view of Liu et al (U.S. Patent 6,211,040), in combination with the following comments.

Chao et al discloses using oxygen, silane and inert gas to deposit a silicon oxide layer 501 over metal interconnect 401 by an HDP-CVD process (Abstract, Figure 5, Column 2, lines 45-46, 51-52, and 65-67, and Column 3, lines 40-50). Chao et al does not teach using an oxygen to silane ratio of 1.7, 1.3 or less, using a total gas flow of the oxygen, silane, and inert gas, of 625 sccm or less, or 500 sccm or less, and using a high frequency bias signal power of 2000 watts or less.

Liu et al discloses using oxygen, silane and inert gas to deposit a silicon oxide layer 52 over metal traces 48 by an HDP-CVD process (Column 4, lines 2-7), using a total gas mixture of oxygen, silane, and inert gas of 330 sccm (Column 4, lines 7-10), and using a high frequency bias signal power of 2000 watts (Column 4, lines 25-27). It would have been within the scope of one of ordinary skill in the art to combine the teachings of Chao et al and Liu et al, to enable the step of forming silicon dioxide layer 501 of Chao et al to be performed, and to provide an effective and very manufacturable method of depositing silicon dioxide between features in the manufacture of in integrated circuits (Liu et al, Column 2, lines 59-62).

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It would have been a matter of routine optimization within the teachings of Chao et al to determine a suitable oxygen to silane ratio, and a suitable high frequency bias signal power to achieve silicon oxide deposition step.

Claim 11 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.


Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0956. **See MPEP 203.08.**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner J. Garcia whose telephone number is (703) 306-5733. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (703) 306-2794. The fax number for this group is (703) 308-7722 (and 7724), and (703) 305-3431 (and 3432). MPEP 502.01 contains instructions regarding procedures used in submitting responses by facsimile transmission.



JAG  
6/9/03



George Fourson  
Primary Examiner